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Factors Associated With Satisfaction or Regret Following Male-to-Female Sex Reassignment Surgery

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This study examined factors associated with satisfaction or regret following sex reassignment surgery (SRS) in 232 male-to-female transsexuals operated on between 1994 and 2000 by one surgeon using a consistent technique. Participants, all of whom were at least 1-year postoperative, completed a written questionnaire concerning their experiences and attitudes. Participants reported overwhelmingly that they were happy with their SRS results and that SRS had greatly improved the quality of their lives. None reported outright regret and only a few expressed even occasional regret. Dissatisfaction was most strongly associated with unsatisfactory physical and functional results of surgery. Most indicators of transsexual typology, such as age at surgery, previous marriage or parenthood, and sexual orientation, were not significantly associated with subjective outcomes. Compliance with minimum eligibility requirements for SRS specified by the Harry Benjamin International Gender Dysphoria Association was not associated with more favorable subjective outcomes. The physical results of SRS may be more important than preoperative factors such as transsexual typology or compliance with established treatment regimens in predicting postoperative satisfaction or regret.

KEY WORDS: transsexual; sex reassignment surgery; follow-up; typology; Standards of Care; autogynephilia.

INTRODUCTION

Sex reassignment surgery (SRS) has been part of the treatment of male-to-female (MtF) transsexuality for more than 70 years and is now widely accepted as therapeutic (Meyer et al., 2001). But individuals considering SRS and the caregivers who serve as their advisors and gatekeepers still have little reliable information concerning preoperative factors that may be associated with more favorable or less favorable outcomes of SRS. Groups such as the Harry Benjamin International Gender Dysphoria Association (HBIGDA), which promulgates Standards of Care for the provision of SRS, lack empirical information to assess the validity of their recommendations (Cohen-Kettenis & Gooren, 1999).

Many follow-up studies of MtF SRS have been conducted. In their comprehensive review, Pfäfflin and Junge (1992/1998) summarized 70 such studies and eight previous reviews, published between 1961 and 1991. The studies they reviewed included results from nearly 2000 patients in 13 countries; approximately three fourths of these patients were MtF transsexuals. Several additional follow-up studies have been conducted since Pfäfflin and Junge's review.

Examination of existing follow-up studies of MtF SRS reveals some significant limitations. Many studies suffer from methodological problems related to small sample sizes, participant heterogeneity, recruitment biases, variations in surgical technique, and unrealistic outcome criteria (for reviews see Abramowitz, 1986, and Carroll, 1999). There is also a growing consensus that subjective criteria (i.e., patients' self-reported satisfaction or regret) may provide a more meaningful basis for evaluating SRS outcomes than the use of so-called objective criteria such as employment, choice of "appropriate" sexual partners, or utilization of psychiatric services (Carroll, 1999; Green & Fleming, 1990; Kuiper & Cohen-Kettenis, 1988; Snaith, Tarsh, & Reid, 1993). Kuiper and Cohen-Kettenis (1988) expressed this viewpoint succinctly: "In our opinion an evaluation of SRS can be made only on the basis of subjective data, because SRS is intended to solve a problem

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that cannot be determined objectively" (p. 441). A lack of focus on patients' self-reported satisfaction limits the contemporary relevance of many early studies.

Candidates for MtF SRS in recent years also appear to be demographically different from those who participated in many earlier outcome studies. Consequently, the conclusions of many older studies may not generalize to the population of MtF transsexuals who currently undergo SRS. This may be particularly true in North America, where demographic changes appear to be especially pronounced. Notably, an increasing number of older biologic males without a history of pervasive femininity, but with a history of sexual attraction to women, now apply for and undergo SRS in North America. Statistics from the Clarke Institute of Psychiatry in Toronto, a major center for the evaluation of gender dysphoric persons, are illustrative. In 1982, only 25% of the MtF transsexuals in the Clarke database were nonhomosexual relative to biologic sex (Freund, Steiner, & Chan, 1982). Three years later this figure had risen to 39% (Blanchard, 1985); and by 1987, 58% of new male referrals for gender dysphoria were nonhomosexual relative to biologic sex (Blanchard, Clemmensen, & Steiner, 1987). By 1992, about 59% of all gender dysphoric males in the Clarke database were nonhomosexual relative to biologic sex (Blanchard & Sheridan, 1992).

Factors Reported To Be Associated With Outcomes of Male-to-Female Sex Reassignment Surgery

Preoperative factors that have been reported to be associated with MtF SRS outcomes can be grouped into three categories. The first consists of factors related to transsexual typology, including age at time of SRS, age at which the person first wished to change sex, childhood gender nonconformity, history of marriage or parenthood, sexual orientation, degree of sexual interest in other persons, and extent of sexual arousal to cross-dressing or cross-gender fantasy. The second category consists of factors related to compliance with accepted treatment regimens, including duration and continuity of hormone therapy, duration of real-life experience in the desired gender role, and amount and adequacy of preoperative psychotherapy. The third category consists of other relevant mental, physical, and social factors, including presence of other psychiatric diagnoses, preoperative circumcision (Muirhead-Allwood, Royle, & Young, 1999a), and degree of family support. Postoperative factors such as the physical and functional results of surgery and adequacy of postoperative psychotherapy have also been reported to be associated with patient satisfaction after SRS.

Preoperative Factors Related to Transsexual Typology

Many researchers have proposed that there are two types of MtF transsexuals. One category includes persons who typically transition at a younger age, report more sexual attraction to and sexual experience with males, are unlikely to have married or to have become biologic parents, and recall more childhood femininity. The other category includes persons who typically transition at an older age, report more sexual attraction to and sexual experience with females, are more likely to have married and to have become biologic parents, report more past or current sexual arousal to cross-dressing or cross-gender fantasy, and recall less childhood femininity. Some transsexuals of the latter type display little interpersonal sexual interest, and have been called *asexual* or (more accurately) *analloerotic* (not sexually attracted to other persons; Blanchard, 1989). These two types of MtF transsexuals have been variously called *homosexual* versus *transvestic* (Money & Gaskin, 1970–1971), *nuclear* versus *fetishistic* (Buhrich & McConaghy, 1978), *core* versus *noncore* (Sørensen, 1981), *nonfetishistic* (*type A*) versus *fetishistic* (*type B*; Freund et al., 1982), *homosexual* versus *nonhomosexual* (i.e., *androphilic* [sexually attracted to males] versus *gynephilic* [sexually attracted to females]; Blanchard, 1988), and *early-onset* versus *late-onset* (Doorn, Poortinga, & Verschoor, 1994).[2] For consistency, this report will use the terms *early-onset/androphilic* versus *late-onset/gynephilic* to distinguish these two transsexual types. In the past, early-onset/androphilic transsexuals have been described as being likely to have more favorable outcomes of SRS than late-onset/gynephilic transsexuals.

Patient satisfaction or other favorable outcomes after MtF SRS have been reported to be associated with younger age (e.g., age less than 30 years; Lundström, Pauly, & Wålinder, 1984; Rehman, Lazer, Benet, Schaefer, & Melman, 1999; Rubin, 1993), sexual attraction to men (Muirhead-Allwood, Royle, & Young, 1999b; but see Bentler, 1976), strong libido and high sexual activity (Lindemalm, Körlin, & Uddenberg, 1987), and early-onset/androphilic transsexualism (Lundström et al., 1984; Sørensen, 1981). Conversely, an increased likelihood of dissatisfaction or regret after MtF SRS has been reported to be associated with older age (Eldh, Berg, & Gustafsson,

[2]The terms *primary* versus *secondary* transsexualism (Person & Ovesey, 1974a, 1974b) are also widely used to frame this dichotomy. However, Person and Ovesey's typology is not strictly congruent with the others listed, in that they considered both homosexual and transvestic transsexuals to be *secondary* transsexuals. In their formulation, *primary* transsexuals were asexual persons with little or no interest in partnered sexual activity and with no history of sexual arousal to cross-dressing or cross-gender fantasy.

1997; Lindemalm et al., 1987; Rubin, 1993; Wålinder, Lundström, & Thuwe, 1978; but see Blanchard, Steiner, Clemmensen, & Dickey, 1989; Krege, Bex, Lümmen, & Rübben, 2001; Kuiper & Cohen-Kettenis, 1988; Schroder & Carroll, 1999), absence of significant gender nonconformity during childhood (Kuiper & Cohen-Kettenis, 1998), late onset of desire for SRS (Kuiper & Cohen-Kettenis, 1998), lack of sexual experience with men (Pfäfflin, 1992), sexual attraction to women (Blanchard et al., 1989; Muirhead-Allwood et al., 1999b; Wålinder et al., 1978), previous marriage (Muirhead-Allwood et al., 1999b; Pfäfflin, 1992; but see Blanchard et al., 1989), biological parenthood (Muirhead-Allwood et al., 1999b; but see Blanchard et al., 1989), asexuality or hyposexuality (Lindemalm et al., 1987), history of fetishistic cross-dressing (Kuiper & Cohen-Kettenis, 1998; Pfäfflin, 1992), and late-onset/gynephilic transsexualism (Green & Fleming, 1990; Landén, Wålinder, Hambert, & Lundström, 1998; Sørensen, 1981).

Preoperative Factors Related to Compliance With Established Treatment Regimens

The widely accepted HBIGDA Standards of Care (Levine et al., 1998; Meyer et al., 2001; Walker, Berger, Green, Laub, Reynolds, & Wolman, 1990) specify minimum eligibility criteria that MtF transsexuals must satisfy before being approved for SRS: "Without first meeting these recommended eligibility requirements, the patient and the therapist should not request . . . surgery" (Meyer et al., 2001, p. 13; Levine et al., 1998, p. 23, omits "recommended"). The most recent edition of the Standards of Care, Version 6 (Meyer et al., 2001), includes the following minimum eligibility criteria for SRS: (a) "12 months of successful continuous full time real-life experience," (b) "usually 12 months of continuous hormonal therapy for those without a medical contraindication,"[3] and (c) "if required by the mental health professional, regular responsible participation in psychotherapy throughout the real-life experience at a frequency determined jointly by the patient and the mental health professional" (p. 28). Version 5 (Levine et al., 1998) contains nearly identical language (p. 36). Version 4 (Walker et al., 1990) has similar provisions, except that a period of hormone therapy, duration unspecified, is *always* required before SRS (p. 4).[4]

Although Versions 5 and 6 both state that "psychotherapy per se is not an absolute eligibility criterion for surgery" (Levine et al., 1998, p. 36; Meyer et al., 2001, p. 28), psychotherapy is commonly required. Moreover, nearly all patients who undergo MtF SRS receive hormone therapy beforehand, and in order to qualify for hormones, patients are required by the Standards of Care to either (a) undergo "a period of psychotherapy of a duration specified by the mental health professional after the initial evaluation (usually a minimum of three months)" (Levine et al., 1998, p. 31; Meyer et al., 2001, p. 20), or else (b) live full-time in the desired gender role for at least 3 months. In North America, MtF transsexuals usually choose the first option. Consequently, 3 months of psychotherapy, often interpreted as 12 hr, is typically considered to be a minimum requirement for SRS by both therapists and clients.

Surgeons are required by the Standards of Care to obtain written recommendations from two mental health professionals before performing SRS (Levine et al., 1998, p. 24; Meyer et al., 2001, p. 14; Walker et al., p. 5). They are also encouraged to "satisfy themselves that the patient is likely to benefit from the procedure apart from the letters recommending surgery" (Levine et al., 1998, p. 39; Meyer et al., 2001, p. 27, omits the final phrase).

Although the Standards of Care establish minimum eligibility criteria for SRS, they also allow caregivers to deviate from these criteria under certain circumstances: "Clinical departures from these guidelines may come about because of a patient's unique anatomical, social, or psychological situation, an experienced professional's evolving method of handling a common situation, or a research protocol" (Levine et al., 1998, p. 3; Meyer et al., 2001, p. 3). Version 4 also allows for occasional exceptions to its minimum requirements (Walker et al., 1990, p. 1). Because of this flexibility, mental health professionals who give approval for SRS and surgeons who perform SRS can accurately claim to "follow the Standards of Care," even if their patients sometimes have not satisfied the Standards' minimum eligibility criteria.

There is a widespread assumption among clinicians that adherence to the minimum eligibility criteria of the Standards of Care is associated with better outcomes of SRS, but supporting evidence is limited (Cohen-Kettenis

[3] An exception is permitted "if a person has lived convincingly as a member of the preferred gender for a long period of time and is assessed to be psychologically healthy after a requisite period of psychotherapy" (Meyer et al., 2001, p. 29; Levine et al., 1998, pp. 36–37, is nearly identical). This situation would probably occur most frequently among female-to-male transsexuals.

[4] Although Version 6 of the Standards of Care is currently in effect, the provisions of Version 4 (January 1990 through May 1998) and Version 5 (June 1998 through February 2001) are also of interest, because these versions were in effect when participants in this study, described later, underwent SRS.

& Gooren, 1999). Patient satisfaction or other favorable outcomes after MtF SRS have been reported to be associated with consistent use of hormones (Carroll, 1999), a real-life experience in the desired gender role of 1 year or longer (Botzer & Vehrs, 1995; Green & Fleming, 1990), and adequate preoperative psychotherapy (Green & Fleming, 1990; Muirhead-Allwood et al., 1999b). Conversely, an increased likelihood of dissatisfaction or regret has been reported to be associated with failure to maintain continuous hormone therapy (Wålinder et al., 1978), absence of any real-life experience in the desired gender role (Pfäfflin & Junge, 1992/1998), and irregular or inadequate psychotherapy (Pfäfflin, 1992).

Preoperative Factors Related to Other Mental, Physical, and Social Conditions

Patient satisfaction or other favorable outcomes after MtF SRS have been reported to be associated with absence of coexisting mental illness or mental instability (Green & Fleming, 1990; Lundström et al., 1984) and adequate family support (Botzer & Vehrs, 1995; Carroll, 1999; Eldh et al., 1997; Ross & Need, 1989). Conversely, an increased likelihood of dissatisfaction or regret has been reported to be associated with coexisting depression, psychosis, personality disorder, or other psychopathology (Bodlund & Kullgren, 1996; Eldh et al., 1997; Muirhead-Allwood et al., 1999b; Pfäfflin & Junge, 1992/1998; Wålinder et al., 1978; Walworth, 1997) and with poor family support (Eldh et al., 1997; Landén et al., 1998; Wålinder et al., 1978). Muirhead-Allwood et al. (1999a) reported that circumcision was associated with less satisfactory outcomes because of less adequate sexual sensation and smaller vaginal dimensions.

Postoperative Factors

Postoperative factors that have been reported to be associated with patient satisfaction or other favorable outcomes after MtF SRS include good cosmetic and functional results of surgery (Botzer & Vehrs, 1995; Eldh et al., 1997; Green & Fleming, 1990; Lundström et al., 1984; Muirhead-Allwood et al., 1999b; Ross & Need, 1989; Schroder & Carroll, 1999; but see Lief & Hubschman, 1993; Pfäfflin & Junge, 1992/1998) and adequate postoperative psychotherapy (Muirhead-Allwood et al., 1999b; Rehman et al., 1999). Conversely, an increased likelihood of dissatisfaction or regret has been reported to be associated with poor surgical results (Lundström et al., 1984) and with failure to perform a complete or satisfactory surgical procedure (Pfäfflin & Junge, 1992/1998).

Overview of the Current Study

To gain a better understanding of the preoperative and postoperative factors associated with patient satisfaction or regret following MtF SRS, this study retrospectively surveyed a large series of MtF SRS patients, all of whom were operated on by one surgeon using a consistent surgical technique. The primary goal of the study was to examine possible associations between subjective outcomes of MtF SRS and relevant preoperative factors identified by prior research. A secondary goal was to investigate possible associations between subjective outcomes and postoperative factors, such as surgical complications and the physical and functional results of surgery. Studying both preoperative and postoperative factors would permit comparison of their relative importance as predictors of subjective outcomes.

METHOD

Participants

Participants were 232 postoperative MtF SRS patients of Toby Meltzer, a surgeon practicing in Portland, Oregon. Participants were surveyed using a mailed questionnaire, described below. Meltzer's office personnel mailed questionnaires to eligible patients, who completed them privately and returned them anonymously in stamped addressed envelopes. All of Meltzer's MtF patients who underwent SRS from May 1994 through March 2000 (N = 727) were eligible to participate. May 1994 marked Meltzer's adoption of his current technique of MtF SRS, which involves creation of a neovagina lined with inverted penile skin, and construction of a sensate neoclitoris from the glans penis using a dorsal neurovascular pedicle; the technique is similar to that described by Fang, Chen, and Ma (1992). The closing date of March 2000 was chosen to ensure that all patients were at least 1-year postoperative when surveyed.

Figure 1 shows the attrition of prospective participants at different stages of contact and solicitation. Patients who underwent SRS from May 1994 through October 1996 (n = 227) had surgery performed at Oregon Health Sciences University (OHSU), where Meltzer was then in academic practice. Meltzer entered private practice in November 1996, and eligible patients who underwent SRS on or after this date (n = 500) had surgery performed at Eastmoreland Hospital. Contact information, albeit not necessarily current, was available for all Eastmoreland patients through Meltzer's private-practice database. Contact information was available for OHSU patients only if they

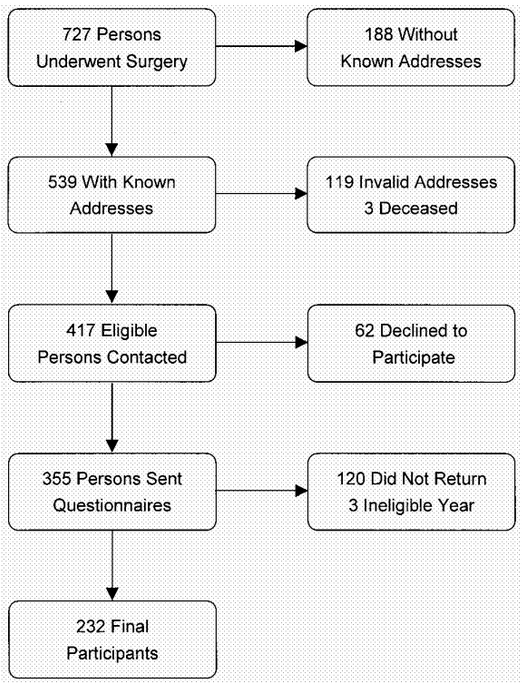

Fig. 1. Attrition of prospective participants during contact and solicitation. Three returned questionnaires were excluded because they reported a year of surgery prior to 1994, the earliest year of eligibility.

had provided this information to Meltzer's office after the database was established in November 1996, typically in connection with a second surgical procedure or inquiry; such information was available for 39 OHSU patients.

To ensure privacy, the research design allowed eligible persons to decline to participate before survey questionnaires were mailed to them. The survey was publicized in advance through electronic media outlets that MtF transsexuals were known to read, and eligible persons were told they could decline to participate by calling a toll-free telephone number or by contacting Meltzer's office by e-mail or by regular mail. Persons who wished to participate were encouraged to provide current contact information. Eligible persons who had not explicitly declined to participate were sent letters describing the survey and explaining how to decline further contact. Sixty-two persons declined participation before or after receiving a letter; privacy concerns or distrust of the investigator's motives were the most common reasons given.

Many explanatory letters were returned undeliverable; these were forwarded, sometimes repeatedly, whenever new mailing addresses could be determined. Eligible persons whose explanatory letters were not returned undeliverable and who had not declined to participate were sent survey questionnaires. Anyone who did not return a questionnaire within approximately 3 weeks was sent another letter requesting her participation, along with a replacement questionnaire.

Table I. Questionnaire Return Rate by Year of Surgery

Year of surgery	Operations performed	Questionnaires returned	(%)
1994[a]	49	5	(10)
1995	98	8	(8)
1996	108	8	(7)
1997	151	40	(26)
1998	147	67	(46)
1999	141	76	(54)
2000[a]	33	26	(79)
Total	727	232[b]	(32)

[a] Partial year.
[b] Includes two questionnaires with no year of surgery given.

Eligible persons received no inducements to participate other than the suggestion that data they provided might offer guidance to future prospective MtF transsexual patients and their caregivers. They were assured that their decision whether or not to participate would not affect ongoing or future care. These procedures were approved by the institutional review board of the Institute for Advanced Study of Human Sexuality (San Francisco, CA).

Participants returned 232 valid questionnaires, which represented 32% of persons who underwent SRS during the study period, 43% of eligible persons in the database, 56% of eligible persons believed to have been successfully contacted, and 65% of eligible persons believed to have received a questionnaire. Table I shows questionnaire return rates by year of SRS. The positive correlation between response rate and year of surgery suggests that nonresponse was more a result of missing or outdated mailing addresses than of eligible persons' reluctance to participate.

Measures

Some questionnaire items were adapted from a questionnaire developed by Muirhead-Allwood (1998) and subsequently used by Muirhead-Allwood et al. (1999a, 1999b) to assess SRS outcomes. Other items were written by the investigator. Questionnaire items relevant to this study can be divided into five categories: (a) 10 preoperative predictor variables related to transsexual typology, (b) 4 preoperative predictor variables related to compliance with established treatment regimens, (c) 4 preoperative

predictor variables related to other relevant mental, physical, and social factors, (d) 4 postoperative predictor variables, and (e) 4 postoperative outcome variables related to satisfaction or regret after SRS.

Preoperative Predictor Variables Related to Transsexual Typology

Participants reported their age at time of SRS, the age at which they first wished to be the other sex or to change sex, and whether they had been married preoperatively (*yes* or *no*) or had been a biologic parent (*yes* or *no*). They responded to Likert-scale questions that assessed their internal feelings of childhood femininity or masculinity prior to age 8 years, and their belief about how feminine or masculine they probably appeared to others prior to age 8 (each on a 5-point scale from *very feminine* to *very masculine*); preoperative frequency of sexual arousal to dressing in women's clothing or to the thought or image of themselves as women (*autogynephilia* [Blanchard, 1989]; 5-point scale from *never* to *hundreds of times or more*, with the additional option of *don't know or not applicable*); preoperative sexual attraction to males and females (7-point Kinsey scale [Kinsey, Pomeroy, & Martin, 1948] from *exclusively attracted to females* to *exclusively attracted to males*, with the additional option of *little or no sexual attraction to males or females*); and preoperative sexual experience with males and females (7-point Kinsey scale, from *exclusively with female partners* to *exclusively with male partners*, with the additional option of *no sexual experience with either males or females*).

Preoperative Predictor Variables Related to Compliance With Established Treatment Regimens

Participants reported their duration of continuous preoperative hormone therapy (in months), duration of preoperative real-life experience in the desired gender role (in months), amount of preoperative psychotherapy (in hr), and whether they felt their preoperative psychotherapy had been adequate (*yes* or *no*).

Preoperative Predictor Variables Related to Other Mental, Physical, and Social Factors

Participants reported their year of surgery; whether they had experienced preoperative depression treated with medication in the 5 years preceding SRS (*yes* or *no*); whether they had been circumcised preoperatively (*yes* or *no*); and how supportive of their gender transition significant family members had been preoperatively (5-point Likert scale from *very unsupportive* to *very supportive*, with the additional option of *not applicable*).

Postoperative Predictor Variables

Participants reported whether they had experienced 10 physical complications of SRS (all rated *yes* or *no*): rectovaginal fistula ("rectovaginal fistula [abnormal opening between rectum and vagina]"); vaginal prolapse ("vaginal prolapse [vagina falling out of the body]"); vaginal stenosis, constant ("narrowing or closing up of your vagina, at all times"); vaginal stenosis, during sexual arousal only ("narrowing or closing up of your vagina, only during sexual arousal"); misdirected urinary stream ("urine stream directed too far forward, or off to one side"); urethral stenosis ("narrowing or closing up of your urethra [urinary opening]"); clitoral necrosis ("necrosis of your clitoris [death or loss of tissue of the clitoris]"); genital pain ("pain in your vagina or genitals"); deep vein thrombosis ("deep vein thrombosis [DVT—blood clot in a leg vein]"); and "other (specify)." They also reported their experience concerning 19 physical and functional outcome variables, all rated on 11-point Likert scales from 0 (*very poor*, *major problem*, etc.) to 10 (*excellent*, *no problem*, etc.). These 19 variables included vaginal depth, vaginal width, vaginal lubrication, vaginal discharge, vaginal hair growth, sensation to touch at the vaginal opening, sensation to touch deep in the vagina, vaginal pain with penetration, vaginal itching, vaginal prolapse, vaginal erotic sensation, clitoral touch sensation, clitoral erotic sensation, clitoral pain, clitoral itching, discharge from around the clitoris, hair on or around the clitoris, urine leakage with cough or strain, and postoperative bladder infections. The mean of the numerical responses to these 19 items was termed *Functional Index*. Other postoperative predictor variables included amount of postoperative psychotherapy or psychological assessment (in hr) and whether participants felt their postoperative psychotherapy was adequate (*yes* or *no*).

Postoperative Outcome Variables Related to Satisfaction or Regret

Participants reported their overall happiness with their SRS result (*Happiness with Result*), rated on an 11-point Likert scale from 0 (*very unhappy*) to 10 (*very happy*); how much they felt their quality of life had improved as a result of SRS (*Improved QOL*), rated on a 21-point Likert scale from −10 (*most worsening possible*) to 10 (*most improvement possible*); their *Regret* at having had SRS, rated *yes*, *sometimes*, or *no*; and their *Reversion* to living as a man after SRS (a possible index

Table II. Means, SDs, and Ranges for Participant Characteristics and Outcomes Represented by Continuous Variables

Participant characteristic or outcome	*M*	*SD*	Range
Age at time of survey[a]	47	9	19–72
Age at SRS	44	9	18–70
Age at first wish to change sex	8	7	2–51
Duration of preoperative hormone therapy (months)	44	43	0–324
Duration of preoperative real-life experience (months)	27	28	0–240
Amount of preoperative psychotherapy[b] (hr)	75	118	0–1000
Amount of postoperative psychotherapy (hr)	8.5	23	0–240
Happiness with SRS result[c]	8.7	1.6	0–10
Improvement in quality of life with SRS[d]	7.9	2.6	−2–10

Note. Ages are rounded to the nearest year.
[a] Calculated as age at SRS + 2001 − year of surgery.
[b] Excludes two participants reporting 2088 and 5000 hr of preoperative psychotherapy.
[c] 0–10 Likert scale.
[d] −10–10 Likert scale.

of regret), with four possible responses: *yes, I live full-time as a man now*; *yes, I live part-time as a man, part-time as a woman now*; *yes, I have lived as a man after SRS, but I live full-time as a woman now*; or *no, I have always lived full-time as a woman after SRS.*

RESULTS

Participant Characteristics

Table II shows means, *SD*s, and ranges for continuous variables representing participant characteristics and outcome measures. Table III shows category frequencies and percentages for ordinal and dichotomous predictor variables representing participant characteristics, with associated outcome measures for each response category. Responses were not normally distributed for most variables, and all outcome measures were heavily skewed toward positive outcomes.

Consistent with the trend discussed earlier, the majority of participants appeared to have been late-onset/gynephilic transsexuals. More than two thirds (69%) of participants were age 40 years or older at the time of SRS. Two thirds (67%) had been married to a female, and nearly half (47%) had been a biologic parent. Nearly two thirds (62%) of participants who had been sexually attracted to other persons of either sex preoperatively reported that their attraction had been primarily or exclusively to females, and three quarters (75%) of participants who had had actual sexual experience with other persons of either sex preoperatively reported that this experience had been primarily or exclusively with females. Nearly half (49%) of those giving a numerical response reported hundreds of episodes or more of preoperative autogynephilic sexual arousal.

Fifty-one participants (22%) reported that they had undergone SRS without satisfying one or more of the minimum eligibility criteria specified in the HBIGDA Standards of Care, at least as these criteria are often interpreted. Thirteen participants (6%) reported less than 12 months of preoperative hormone therapy; their mean duration of hormone therapy was 7.2 months (*SD*, 2.9 months). Thirty-six participants (16%) reported less than 12 months of preoperative real-life experience in the desired gender role; their mean duration of real-life experience was 6.7 months (*SD*, 2.8 months). Fourteen participants (6%) reported fewer than 12 hr of preoperative psychotherapy related to gender issues; their mean amount of preoperative psychotherapy was 5.9 hr (*SD*, 3.2 hr). Ten of the above-listed participants failed to satisfy more than one of the minimum eligibility criteria (real-life experience and hormone therapy, six participants; real-life experience and psychotherapy, two participants; all three criteria, two participants).

Overall Outcomes

Most participants were extremely satisfied overall with their SRS outcomes. Forty-one percent of participants rated their Happiness with Result as 10 on 0–10-point scale, and 86% rated it as 8 or higher. Only nine participants (4%) rated their Happiness with Result as ≤5, the midscale value. Considering Improved QOL with SRS, 42% of participants rated the improvement as 10 on a −10–10 scale, and 59% rated the improvement as 8 or higher. Only seven participants rated their quality of life as unchanged, and only one participant rated it as worsened; together these represented only 3% of participants.

No participants reported consistent Regret, and only 15 participants (6%) were sometimes regretful. All regretful participants provided explanatory comments. Eight regretful participants cited disappointing physical or functional outcomes of surgery as the reason for their regret (e.g., "After losing my clitoris, I entered a deep depression. Feeling is severely diminished."), while five others cited familial or social problems (e.g., "I miss my family and children. I am an outcast in my family."). Only two participants (1%) reported reversion to living as a man after SRS. Both these individuals lived part-time as men but most of

Table III. Outcomes of SRS by Participant Characteristics

Participant characteristic	*n*	(%)[c]	Regretful sometimes *n*	Regretful sometimes (%)[d]	Happiness with result[a] *M*	Happiness with result[a] (*SD*)	Improved QOL[b] *M*	Improved QOL[b] (*SD*)
Childhood femininity in own opinion								
Very feminine	41	(18)	2	(5)	8.9	(1.4)	8.8	(2.6)
Somewhat feminine	73	(32)	1	(1)	8.9	(1.5)	8.1	(2.5)
Equally/neither	88	(39)	6	(7)	8.5	(1.9)	7.7	(2.5)
Somewhat masculine	19	(8)	5	(26)	8.8	(1.2)	7.4	(1.9)
Very masculine	5	(2)	1	(20)	8.0	(2.9)	6.8	(2.8)
Childhood femininity in others' probable opinion								
Very feminine	21	(9)	1	(5)	8.8	(1.4)	8.4	(2.3)
Somewhat feminine	44	(19)	3	(7)	8.7	(1.6)	9.1	(1.7)
Equally/neither	63	(28)	4	(6)	8.8	(1.7)	7.4	(3.1)
Somewhat masculine	69	(31)	6	(9)	8.8	(1.5)	7.8	(2.3)
Very masculine	29	(13)	1	(3)	8.3	(2.2)	7.6	(2.6)
Preoperative marriage to a female								
Yes	153	(67)	9	(6)	8.8	(1.5)	7.9	(2.5)
No	77	(33)	6	(8)	8.6	(2.0)	8.1	(2.6)
Preoperative biologic parent								
Yes	108	(47)	9	(8)	8.8	(1.6)	7.8	(2.6)
No	122	(53)	6	(5)	8.7	(1.7)	8.1	(2.5)
Preoperative sexual attraction[e]								
Females (F) exclusively	59	(30)	4	(7)	8.7	(1.7)	8.3	(2.1)
F primarily, M incidentally	64	(32)	5	(8)	8.6	(1.8)	7.5	(2.6)
F mostly, but also M	32	(16)	3	(9)	8.7	(1.4)	7.6	(2.9)
F and M about equally	17	(9)	0	(0)	8.9	(1.0)	7.6	(2.3)
M mostly, but also F	7	(4)	0	(0)	9.3	(0.8)	8.4	(1.6)
M primarily, F incidentally	10	(5)	0	(0)	9.7	(0.5)	8.2	(3.3)
Males (M) exclusively	11	(6)	1	(9)	8.4	(1.7)	9.5	(0.9)
Preoperative sexual experience[f]								
Females (F) exclusively	103	(48)	5	(5)	8.7	(1.6)	8.2	(2.3)
F primarily, M incidentally	58	(27)	5	(9)	8.6	(1.8)	7.5	(2.9)
F mostly, but also M	23	(11)	0	(0)	9.2	(1.0)	7.7	(2.9)
F and M about equally	4	(2)	1	(25)	9.0	(2.0)	9.3	(1.0)
M mostly, but also F	7	(3)	1	(14)	8.3	(1.3)	6.7	(2.6)
M primarily, F incidentally	9	(4)	1	(11)	9.0	(1.1)	7.6	(3.4)
Males (M) exclusively	10	(5)	1	(10)	8.6	(1.8)	9.5	(1.0)
Preoperative analloeroticism								
Yes	27	(12)	2	(7)	8.6	(2.0)	7.8	(3.2)
No	200	(88)	13	(7)	8.7	(1.6)	8.0	(2.5)
Preoperative autogynephilic arousal								
Never	30	(14)	1	(3)	8.8	(1.3)	8.7	(2.5)
Once or twice	21	(10)	2	(10)	9.0	(1.3)	8.8	(1.6)
A dozen times or less	30	(14)	1	(3)	8.8	(1.3)	8.4	(2.0)
Dozens of times	29	(13)	3	(10)	8.2	(2.5)	7.0	(3.2)
Hundreds of times or more	106	(49)	7	(7)	8.8	(1.4)	7.7	(2.6)
Preoperative hormone therapy								
<12 months	13	(6)	0	(0)	8.8	(1.8)	8.8	(1.7)
≥12 months	214	(94)	15	(7)	8.7	(1.7)	7.9	(2.6)
Preoperative real-life experience								
<12 months	36	(16)	0	(0)	8.4	(1.9)	7.9	(2.8)
≥12 months	192	(84)	15	(8)	8.8	(1.6)	8.0	(2.5)
Preoperative psychotherapy								
<12 hr	14	(6)	0	(0)	9.6	(0.6)	8.8	(1.9)
≥12 hr[g]	205	(94)	13	(6)	8.7	(1.6)	7.9	(2.6)
Preoperative psychotherapy adequate								
Yes	216	(97)	15	(7)	8.7	(1.7)	8.0	(2.5)
No	7	(3)	0	(0)	9.1	(0.7)	5.6	(4.4)

Table III. (*Continued*)

Participant characteristic	*n*	(%)[c]	Regretful sometimes *n*	Regretful sometimes (%)[d]	Happiness with result[a] *M*	Happiness with result[a] (*SD*)	Improved QOL[b] *M*	Improved QOL[b] (*SD*)
Preoperative medication for depression								
Yes	63	(27)	5	(8)	8.7	(1.5)	7.7	(2.9)
No	167	(73)	10	(6)	8.7	(1.7)	8.0	(2.4)
Preoperative circumcision								
Yes	198	(86)	13	(7)	8.7	(1.7)	7.8	(2.6)
No	31	(14)	2	(6)	9.0	(1.6)	8.4	(2.4)
Family support vs. nonsupport								
Very unsupportive	57	(27)	4	(7)	8.7	(2.0)	7.7	(2.7)
Somewhat unsupportive	38	(18)	4	(11)	8.7	(1.5)	8.0	(2.2)
Neither	12	(6)	1	(8)	8.3	(1.2)	7.8	(2.0)
Somewhat supportive	47	(22)	2	(4)	8.9	(1.3)	7.8	(2.8)
Very supportive	60	(28)	2	(3)	8.9	(1.0)	8.2	(2.7)
Year of Surgery								
1994[h]	5	(2)	1	(20)	6.6	(4.0)	5.6	(4.0)
1995	8	(3)	0	(0)	8.8	(1.0)	8.0	(3.3)
1996	8	(3)	1	(13)	7.8	(2.8)	6.9	(2.3)
1997	40	(17)	3	(8)	8.6	(1.5)	7.8	(2.6)
1998	67	(29)	3	(4)	9.0	(1.5)	8.1	(2.6)
1999	76	(33)	6	(8)	8.8	(1.5)	8.2	(2.5)
2000[h]	26	(11)	1	(4)	8.8	(1.4)	8.0	(1.6)
Postoperative psychotherapy adequate								
Yes	188	(86)	11	(6)	8.7	(1.6)	8.1	(2.4)
No	30	(14)	4	(13)	8.5	(2.1)	6.9	(3.4)
Significant surgical complications[i]								
None	157	(68)	6	(4)	9.2	(1.0)	8.0	(2.6)
One	55	(24)	5	(9)	8.1	(1.9)	7.6	(2.6)
Two	16	(7)	3	(19)	7.7	(1.9)	8.3	(2.1)
Three	4	(2)	1	(25)	3.8	(4.3)	5.8	(4.2)

[a] 0–10 Likert scale.
[b] −10–10 Likert scale.
[c] Of those responding to a question.
[d] Of those giving a particular response.
[e] Excludes 27 participants reporting little or no attraction to other persons of either sex.
[f] Excludes 12 participants reporting no sexual experience with other persons of either sex.
[g] Excludes two participants reporting 2088 and 5000 hr of preoperative psychotherapy.
[h] Partial year.
[i] Excludes misdirected urinary stream.

their lives as women; in both cases their reversions were minor and infrequent (one presented as a male only to play golf; the other was retiring from a professional career and sometimes presented as a male when seeing clients). One of these two participants was sometimes regretful.

To facilitate the comparison of Regret, a negative outcome, with the two positive outcome variables, Regret *sometimes* was dummy-coded as *0* and Regret *no* was dummy-coded as *1*, creating a positive *Absence of Regret* measure. The three positive outcome variables were moderately intercorrelated. The Spearman rank-order correlation were: for Absence of Regret and Happiness with Result, .29; for Absence of Regret and Improved QOL, .26; and for Happiness with Result and Improved QOL, .33 ($p < .0001$ for all correlations).

Outcomes in Relation to Participant Characteristics

Table IV shows Spearman rank-order correlations between preoperative and postoperative predictor variables and outcome measures. Although more than 70 associations were examined, the alpha level for rejecting null hypotheses was set at .05; this made it probable that a few associations would be judged significant simply on the basis of chance. At this alpha level, the study's power to

Table IV. Spearman Rank-Order Correlations Between Predictor Variables and Outcomes of SRS

Predictor variable	Absence of regret	Happiness with result	Improved QOL
Transsexual typology			
Age at SRS	.03	.12	.00
Age at first wish to change sex	−.15*	.00	−.03
Childhood femininity in own opinion	.19**	.11	.27***
Childhood femininity in others' probable opinion	.00	.03	.19**
Marriage to a female	.04	−.03	−.08
Biologic parenthood	−.07	−.01	−.09
Sexual attraction to males vs. females[a]	.04	.04	.03
Sexual experience with males vs. females[b]	−.07	.02	−.02
Analloeroticism	−.01	−.01	−.03
Frequency of autogynephilic arousal	−.03	−.01	−.16*
Compliance with established treatment regimens			
Duration of hormone therapy	−.05	−.02	.02
Duration of real-life experience	−.07	.15*	.04
Amount of preoperative psychotherapy[c]	−.07	−.10	−.16*
Adequacy of preoperative psychotherapy	−.04	−.02	.12
Hormone therapy ≥12 months	−.07	−.05	−.09
Real-life experience ≥12 months	−.11	.08	.00
Preoperative psychotherapy ≥12 hr[c]	−.07	−.18**	−.10
Other preoperative factors			
Medication for depression	−.04	−.03	−.02
Circumcision	.00	−.08	−.09
Family support vs. nonsupport	.08	−.02	.09
Year of surgery	.02	.09	.03
Postoperative factors			
Amount of postoperative psychotherapy	−.04	−.21**	−.19**
Adequacy of postoperative psychotherapy	.10	.01	.12
Number of significant surgical complications[d]	−.17**	−.37***	−.09
Functional Index	.28***	.49***	.35***

Note. All p values are two-tailed.
[a] Excludes 27 participants reporting little or no attraction to other persons of either sex.
[b] Excludes 12 participants reporting no sexual experience with other persons of either sex.
[c] Excludes two participants reporting 2088 and 5000 hr of preoperative psychotherapy.
[d] Excludes misdirected urinary stream.
* $p < .05$. ** $p < .01$. *** $p < .0001$.

detect medium or larger effect sizes ($r \geq .30$) exceeded 99% (Cohen, 1988).

Most predictor variables showed no significant association with outcome measures, and for the associations that were significant, effect sizes were generally small. The notable exception was Functional Index, where correlations were in the moderate-to-large range for all three outcome variables. Correlations are reviewed for each outcome measure.

Regret/Absence of Regret

Childhood femininity in the participant's own opinion and age at first wish to change sex were the only preoperative variables related to transsexual typology that showed significant correlations with Absence of Regret; greater childhood femininity and younger age at first wish to change sex were associated with less regret. No preoperative variables associated with compliance with accepted treatment regimens or other preoperative variables showed significant correlations. Among postoperative variables, both number of significant surgical complications and Functional Index showed significant correlations with Absence of Regret; fewer complications and a higher Functional Index were associated with less regret.

The magnitudes of these correlations indicated small-to-medium effect sizes (Cohen, 1988). For the most significant preoperative predictor variable, childhood femininity in the participant's own opinion, the variance accounted for (r_s^2) was 3.6%. For the most significant postoperative predictor variable, Functional Index, the variance accounted for was 7.8%.

Happiness With Result

No preoperative variables related to transsexual typology showed significant correlations with Happiness with Result. Two variables associated with compliance with accepted treatment regimens showed significant correlations: duration of real-life experience, which was positively associated with happiness, and the dichotomized variable preoperative psychotherapy ≥12 hr, which was negatively associated with Happiness with Result. However, the continuous variable from which the latter was derived, amount of preoperative psychotherapy, did not show a significant correlation. Among postoperative variables, amount of postoperative psychotherapy was significantly and negatively associated with Happiness with Result. Number of significant surgical complications and Functional Index both showed moderate-to-large correlations with Happiness with Result, in the expected directions.

Effect sizes were small for significant preoperative predictor variables. For duration of real-life experience, arguably the most meaningful of these, the amount of variance accounted for (r_s^2) was 2.3%. By contrast, for the postoperative variable Functional Index the amount of variance accounted for was 24%.

Improved Quality of Life

Childhood femininity in the participant's own opinion, childhood femininity in others' probable opinion, and frequency of autogynephilic arousal were the only preoperative variables related to transsexual typology that showed significant correlations with Improved Quality of Life (QOL). Greater childhood femininity by both measures and less frequent autogynephilic arousal were associated with greater improvement in quality of life. Among variables associated with compliance with accepted treatment regimens, amount of preoperative psychotherapy was significantly and negatively associated with Improved QOL. No other preoperative variables showed significant correlations with Improved QOL. Among postoperative variables, amount of postoperative psychotherapy was significantly and negatively associated with Improved QOL. Functional Index showed the most significant correlation with Improved QOL, in the expected direction.

Among significant preoperative predictor variables, the effect size was largest for childhood femininity in the participant's own opinion; the amount of variance in outcome accounted for (r_s^2) was 7.3%. The postoperative variable Functional Index accounted for 12% of the variance in Improved QOL.

Participant Characteristics and Outcomes in Years With Low versus High Response Rates

The survey's low overall response rate, 32%, may raise questions as to whether the survey participants constituted a representative sample of all those who underwent SRS with Meltzer during the study period. To address this issue, it is useful to compare the characteristics and outcomes of participants who underwent SRS from partial year 1994 through 1999, for whom the aggregate response rate was 29% (possibly an unrepresentative sample), and those who underwent SRS in partial year 2000, for whom the response rate was 79% (probably a fairly representative sample). These comparisons, along with accompanying probability values, are presented in Table V. Participants from partial year 2000 were very similar to participants from the earlier years of the study for all characteristics and outcomes examined.

DISCUSSION

The purpose of this study was to investigate the extent to which previously identified preoperative and postoperative factors were significantly associated with outcomes of MtF SRS. Given the extremely high levels of satisfaction and low levels of regret expressed by the participants, such an investigation might seem unnecessary. More than 96% of participants gave a positive rating to their overall happiness with their SRS result and 97% reported that SRS had improved the quality of their lives. No participants regretted SRS outright, and only 6% were even occasionally regretful. Only two participants (1%) had reverted to the male gender role, even temporarily, and in both cases their reversions were of little significance. Using the comparisons suggested by Green and Fleming (1990), it is hard to imagine any other major life decision—whether to have married a specific person, whether to have had children, whether to have pursued a specific occupation—that would yield such an overwhelmingly positive set of subjective outcomes. Superficially, the results of MtF SRS appear to be so uniformly good that looking for factors predictive of satisfaction or regret might seem a pointless exercise. However, because existing beliefs concerning putative predictors of satisfaction or regret continue to affect the lives of candidates for MtF SRS and continue to influence the Standards of Care, such an investigation is warranted.

Transsexual Typology as a Predictor of Outcomes

Most participant characteristics related to transsexual typology showed no significant associations with

Table V. Characteristics and Outcomes of Participants Who Underwent SRS During Years 1994–1999 versus Year 2000

Participant characteristic or outcome	1994[a]–1999	2000[a]	*p*
Mean age at SRS	44	44	.98
Mean age at first wish to change sex	8	8	.78
Very or somewhat feminine as a child, in own opinion	49%	60%	.31
Very or somewhat feminine as a child, in others' probable opinion	28%	32%	.69
Married to a female preoperatively	66%	72%	.54
Biologic parent preoperatively	46%	56%	.36
Preoperative sexual attraction primarily or exclusively to females[b]	63%	58%	.68
Preoperative sexual experience primarily or exclusively with females[c]	77%	70%	.45
Preoperative analloeroticism	13%	4%	.33
Preoperative autogynephilic arousal hundreds of times or more	48%	57%	.45
Mean duration of preoperative hormone therapy (months)	46	32	.14
Mean duration of preoperative real-life experience (months)	27	22	.39
Mean amount of preoperative psychotherapy[d] (hr)	73	90	.52
Preoperative psychotherapy adequate	96%	100%	.34
Preoperative medication for depression	27%	24%	.74
Circumcised preoperatively	86%	92%	.54
Family very or somewhat supportive preoperatively	50%	48%	.83
Mean amount of postoperative psychotherapy (hr)	8.8	5.6	.52
Postoperative psychotherapy adequate	85%	96%	.21
One or more significant surgical complications[e]	33%	27%	.54
Mean Functional Index[f]	8.1	8.0	.51
Regret SRS sometimes	6.9%	3.8%	.56
Mean happiness with SRS result[f]	8.7	8.8	.80
Mean improvement in quality of life with SRS[g]	8.0	8.0	.98

Note. For 1994[a]–1999, $n = 204$, representing 29% of 694 eligible persons; for 2000[a], $n = 26$, representing 79% of 33 eligible persons. p values are from t tests for continuous variables, and from χ^2 or Fisher's exact tests for dichotomous variables. All p values are two-tailed. Ages are rounded to the nearest year.

[a] Partial year.

[b] Excludes 27 participants reporting little or no attraction to other persons of either sex.

[c] Excludes 12 participants reporting no sexual experience with other persons of either sex.

[d] Excludes two participants reporting 2088 and 5000 hours of preoperative psychotherapy.

[e] Excludes misdirected urinary stream.

[f] 0–10 Likert scale.

[g] −10–10 Likert scale.

outcomes. These included age at time of SRS, previous marriage and parenthood, sexual attraction to and sexual experience with males versus females, and degree of erotic interest in other persons. Only a few typological characteristics showed statistically significant correlations with outcomes, and these correlations were generally weak. Childhood femininity in the participant's own opinion was the most important factor; it was significantly correlated with Absence of Regret and Improved QOL, and it showed the largest effect sizes.

These results differ from the conclusions of many earlier studies that reported clinically meaningful associations between transsexual typology and quality of outcomes. The difference may, in part, reflect methodological factors. Earlier investigators often gauged outcomes in objective rather than subjective terms, sometimes basing their assessments on specific aspects of gender reorientation at which early-onset/androphilic transsexuals generally excelled, such as passing convincingly or engaging in sexual relationships with men (e.g., Bodlund & Kullgren, 1996; Lindemalm et al., 1987). It is also possible that something genuinely may have changed over the last one to two decades to reduce differences in postoperative satisfaction between early-onset/androphilic and late-onset/gynephilic transsexuals. Arguably, it has become easier over this period for MtF transsexuals generally, but for late-onset/gynephilic transsexuals especially, to live successfully in North American and Western European societies. Transsexuals in these areas now have greater access to information, role models, support groups, service providers, employer acceptance, and civil rights than in earlier decades. Greater social acceptance and support may allow late-onset/gynephilic transsexuals especially to evaluate their transitions generally, and their surgical

outcomes specifically, on their own terms, and thus perhaps more favorably.

It may seem surprising that in the current study, childhood femininity in the participant's own opinion showed stronger associations with outcomes than did childhood femininity in others' probable opinion. To the extent that transsexual typology is believed to be associated with outcomes, one might expect just the reverse, because overtly displayed femininity is more closely associated with the underlying typology. For example, Doorn et al. (1994) reported that early-onset/androphilic transsexuals recalled preferring female-typical toys, games, and play activities significantly more frequently than did late-onset/gynephilic transsexuals. However, the two groups did not differ significantly in recalled childhood gender identity. In this study, the observed stronger associations of outcomes with childhood femininity in the participant's own opinion suggest that the latter variable may not be functioning primarily as an indicator of transsexual typology. Instead, it may simply be an indicator of childhood gender dysphoria, which may be experienced by children who will subsequently belong to either transsexual type.

Compliance With Established Treatment Regimens as a Predictor of Outcomes

None of the participant variables related to preoperative treatment regimens were significantly associated with regret or its absence. Duration of preoperative real-life experience in the desired gender role showed a small but significant association with Happiness with Result, but not with any other outcome measure. Greater amounts of preoperative psychotherapy were associated with poorer subjective outcomes, although this could be due to participants with more severe psychological problems undergoing more psychotherapy, rather than psychotherapy itself causing negative outcomes.

Participants who reported less than 12 months of preoperative hormone therapy, less than 12 months of preoperative real-life experience in the desired gender role, or less than 12 hr of preoperative psychotherapy experienced outcomes that did not differ significantly from outcomes in participants who had complied with these minimum eligibility criteria of the HBIGDA Standards of Care. Nor was it the case that noncompliant participants showed trends toward less favorable outcomes that simply did not achieve statistical significance: In seven of the nine associations examined, noncompliant participants showed nonsignificant trends toward more favorable outcomes.

All survey participants did comply with the Standards of Care in one important respect: They all received letters of recommendation for SRS from two mental health professionals, since Meltzer requires these from all surgical candidates. Perhaps for the MtF transsexuals surveyed in this study, the recommendation of two experienced professionals was in itself sufficient to guarantee a high probability of subjectively satisfying outcomes, even when the minimum eligibility criteria of the Standards of Care had not been met. The seemingly paradoxical observation of nonsignificant trends toward more favorable outcomes in participants who did not comply with these minimum requirements is consistent with such an explanation: Therapists may be more willing to waive such requirements for persons they otherwise regard as especially favorable surgical candidates.

Postoperative Factors as Predictors of Outcomes

The two postoperative predictor variables concerned with the physical and functional outcomes of SRS, number of significant surgical complications and Functional Index, showed the largest and most consistent associations with all outcome measures. These findings suggest that the physical results of surgery, which can only be known postoperatively, are likely to be far more influential in determining satisfaction or regret following MtF SRS than anything that can be known about an applicant preoperatively, including her compliance with accepted treatment protocols. Although it may seem obvious in retrospect that the physical and functional results of surgery would be the most reliable predictors of satisfaction after surgery, the comprehensive review conducted by Pfäfflin and Junge (1992/1998) found the evidence concerning this issue to be equivocal.

Rehman et al. (1999) have argued that the HBIGDA Standards of Care should be changed to include a recommended period of postoperative psychotherapy. The results of this study provide little support for such a suggestion: Rated adequacy of postoperative psychotherapy was not significantly associated with any outcome measure, and more postoperative psychotherapy was actually associated with less satisfactory subjective outcomes. Changing the Standards of Care to encourage treatment that is associated with less satisfactory outcomes would be inconsistent with an evidence-based approach to care.

Limitations and Generalizability

Information about participants' experiences and attitudes was based entirely on self-reports. Although the

accuracy of such data cannot be guaranteed, self-reports are often the primary source and sometimes the only source of information available to caregivers concerning many of the preoperative factors that this study considered. This makes the current results clinically relevant despite possible inaccuracies due to self-reporting. Information concerning preoperative factors was collected 1–7 years postoperatively, which might have resulted in inaccuracies because of forgetting, or because of coloring of preoperative recollections based on postoperative experiences. On the other hand, postoperatively collected data may be more accurate in some ways than data collected preoperatively, because it is less likely to be distorted by selective reporting or deliberate dissimulation, which transsexuals sometimes believe are required in order to obtain surgery (Lawrence, 1997; Walworth, 1997). A research design that collected data preoperatively for later matching with postoperatively collected data probably would appear less confidential, and might promote less candid disclosure. Such a design might also result in lower response rates. Presumably, there would be less motivation to engage in selective reporting or dissimulation after the desired surgical services had been provided.

Because only 32% of eligible persons returned questionnaires, it is possible that the study participants may not have constituted a representative sample of all those who underwent SRS with Meltzer during the study period. The study design did not permit nonrespondents to be contacted to ascertain whether they differed from respondents, so the following comments are necessarily conjectural. Persons who experienced especially favorable results might have been more likely to reply because of their feelings of gratitude, and some individuals who experienced regret or unsatisfactory outcomes might have committed suicide, become institutionalized, or become reclusive; these factors could have biased the results toward more positive outcomes. Conversely, dissatisfied persons might have had a greater propensity to participate, either because they felt an obligation to warn others, or because they simply desired to have their complaints heard. Moreover, because Meltzer offers to correct unsatisfactory results without charge, dissatisfied patients might have been more likely to have returned for corrective procedures, and thus more likely to have had up-to-date contact information on file. Either of these latter factors could have biased the results toward less positive outcomes by increasing the participation rates of dissatisfied persons.

Response rates may have been influenced by transsexual typology. Traditionally, early-onset/androphilic transsexuals are believed to be more likely to assimilate or "disappear into the woodwork" after SRS. This could have made early-onset/androphilic persons less likely to have been successfully contacted, or less likely to have responded if contacted. Late-onset/gynephilic transsexuals, on the other hand, are generally believed to have better access to the electronic media, such as the Internet, that were used to publicize the survey. This could have resulted in either greater likelihood of receiving and possibly completing a questionnaire (if a person learned about the survey and was able to supply an updated address), or lesser likelihood of doing so (if a person learned about the survey and declined to receive survey materials without having the opportunity to examine them).

One way to assess the degree of bias that may have resulted from a low overall response rate is to compare the characteristics and outcomes of participants who underwent SRS in partial year 2000, for whom the response rate was 79%, with those of participants who underwent SRS from partial year 1994 through 1999, for whom the aggregate response rate was only 29%. Table V shows the high degree of similarity between these two groups over a wide range of characteristics and outcomes. The participants from partial year 2000 probably constituted a relatively unbiased sample of the entire population of persons who underwent SRS in partial year 2000, since they comprised fully 79% of that population; and the characteristics and outcomes of the participants from earlier years were very similar to those of the participants from partial year 2000 in nearly all respects. The most parsimonious explanation of this similarity is that participants from partial year 2000 and participants from the earlier years both constituted relatively unbiased samples of a postoperative transsexual population that remained fairly consistent in its characteristics and outcomes over the 6-year period studied. If this explanation is correct, then any biases related to the study's low overall response rate are likely to have been small.

Health insurance rarely covers the cost of SRS in the United States, and most individuals pay for SRS out of their own pockets. Moreover, the cost of SRS with Meltzer in the final year of the survey was about $15,000, which is higher than with most other surgeons. As a result, participants in this study probably included a higher percentage of late-onset/gynephilic persons than the population of postoperative MtF transsexuals in the United States generally, because late-onset/gynephilic persons typically would have had more time to acquire the funds to pay for an expensive operation. In comparison to countries where SRS is paid for by national health insurance policies offering universal coverage, the relative overrepresentation of late-onset/gynephilic persons in this study is likely to

have been even greater. Consequently, extrapolation of this study's findings to other MtF transsexual populations should be done cautiously.

In this study, it was rarely necessary to reject the null hypotheses of no significant associations between preoperative factors and outcomes, against a background of very good and relatively consistent physical results of surgery. In postoperative populations in which physical outcomes were more variable, significant associations between outcomes and preoperative factors would probably be even more difficult to discern, because of the increased variance attributable to postoperative physical factors. Thus, among the patients of surgeons with less satisfactory or less consistent results, rejection of such null hypotheses probably would be even less likely.

Implications for Surgical Applicants, Caregivers, and Expert Bodies

The present results should reassure surgical applicants that it is currently possible to undergo MtF SRS with a high probability of achieving a satisfactory outcome and with a low probability of even occasional regret, at least with the specific surgeon involved in this study. The qualification is an important one. Because the physical and functional qualities of the surgical result achieved were so strongly associated with subjective outcomes, choice of surgeon may be more important than most other preoperative factors examined in this study in influencing postoperative satisfaction or regret.

Mental health professionals may need to reconsider the conventional clinical wisdom that factors associated with transsexual typology are important predictors of satisfaction or regret following MtF SRS. This study suggests that the most important typological aspect of client history to consider may be recalled internal feelings of femininity during childhood. This variable showed significant associations with two outcome measures, and was a better predictor of outcomes than recalled overtly displayed childhood femininity. However, recalled internal feelings of childhood femininity may be an indicator of childhood gender dysphoria more than an indicator of transsexual typology.

The current results also suggest that, at least when dealing with transsexual populations similar to that studied, mental health professionals may trust their clinical judgment in deciding whether clients who have not fulfilled some of the minimum eligibility criteria of the HBIGDA Standards of Care are suitable candidates for SRS. Participants who, with the recommendation of their caregivers, underwent SRS after only a few hours of psychotherapy, with less than 12 months of preoperative hormone therapy, or with less than 12 months of preoperative real-life experience in the desired gender role reported outcomes similar to participants who had fulfilled these minimum requirements. For most associations examined, participants who were approved for SRS despite nonfulfillment of these minimum requirements actually showed nonsignificant trends toward better subjective outcomes.

Expert bodies such as the Harry Benjamin International Gender Dysphoria Association may wish to reexamine the value of current minimum eligibility criteria for MtF SRS, assuming that the rationale for such criteria is to minimize the probability of postoperative regret and to maximize the probability of postoperative satisfaction, rather than to create barriers to care. The minimum eligibility criteria for SRS in the HBIGDA Standards of Care do not explicitly require a specific number of hours of psychotherapy, and they contain some flexibility concerning the duration of preoperative hormone therapy, but they require a 12-month real-life experience in the desired gender role without exception. Based on the results of this study, a 12-month real-life experience appears to be unnecessary for some applicants for MtF SRS. Some therapists already appear to have reached this conclusion, since 16% of participants in this study reported that they were approved for SRS without having fulfilled this requirement. Since a 12-month minimum real-life experience has never been demonstrated to be associated with more favorable outcomes in a published, peer-reviewed follow-up study (Lawrence, 2001), and because it was not associated with more favorable outcomes in this study, perhaps this requirement should be relaxed until there is empirical evidence demonstrating which, if any, candidates for MtF SRS it might genuinely benefit.

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